

2014 - 1ST QUARTER UCM SECTION 2.9.3 BACKUP MATERIAL

2.9.3. Reclaimed Water Systems

A. Size/Capacity Determination

1. General
 - a. Hazen Williams Friction Coefficient $C = 100$ for ductile iron or 120 for plastic pipe.
 - b. Maximum static pressure = 120 psi.
2. Peak Demand Requirements
 - a. The maximum velocity shall not exceed 5 feet per second.
 - b. The minimum pressure at any point in the affected pressure zone must not be less than 35 psi.
 - c. Mains shall be sized to accommodate max day flows of:
 - i. 8100 gallons per irrigated acre
 - ii. 28 gallons per ton of cooling
 - iii. Indoor use based on fixture units.
3. Emergency Demand (Fire Flow) Requirements

None – fire flows are provided by the water system.
4. Plans shall include a detail of a reclaimed water identification sign. Plans shall show the posting locations for the sign.

B. Mains

1. Sizing of Mains – Computer modeling is preferred for sizing reclaimed water mains. However, for mains less than 16 inches in diameter other engineering calculation methods may be accepted. Standard main sizes are: 6, 8, 12, 16, 24, 30, 36, 42, and 48 inches. A 4 inch pipe size shall be considered for mains less than 200 feet in length.
2. **All reclaimed water mains shall be constructed of ductile iron pipe, Pressure Class 350 minimum for pipe 12-inch diameter and smaller and Pressure Class 250 for pipe greater than 12-in diameter. For mains 12-inch diameter and smaller, PVC pipe, conforming to the requirements of AWWA C-900, DR 14 shall be acceptable.** Plans shall indicate that all mains

and appurtenances shall be manufactured in purple, factory painted purple or bagged in purple. Color shall match Pantone 522.

3. Mains should be located where maintenance can be accomplished with the least interference with traffic, structures, and other utilities. *In major collector and arterial roadways, mains should be located outside the pavement, curbs, etc., wherever feasible. When mains are located outside of the right-of-way, they shall be within a dedicated utility easement. Main assignments in such city streets must be approved by the Utility Location and Coordination Committee. Assignments for lines in county roads must also be approved by the county engineer. A minimum horizontal separation distance of five (5) feet, measured from OD of pipe to OD of pipe, shall be maintained between existing or proposed reclaimed water mains and all other utilities and/or conduits in order to maintain trench integrity.*

4. The separation of reclaimed mains from water and wastewater mains must comply with TCEQ rules. ~~In major collector and arterial roadways, mains should be located outside the pavement, curbs, etc., wherever feasible. When mains are located outside of the right-of-way, they shall be within a dedicated utility easement. Main assignments in such city streets must be approved by the Utility Location and Coordination Committee assignments for lines in such county roads must also be approved by the county engineer.~~

5. Piping materials and appurtenances shall conform to City of Austin Standard Specifications, Standard Details, and the Utility's Standard Products List (SPL).

6. Minimum depth of cover over the uppermost projection of the pipe and all appurtenances shall comply with City of Austin Standard Details; maximum depth will be as approved by the Utility for the specific materials, application and conditions.

7. For mains of 16 inches and larger, drain valves shall be placed at low points.

8. On water mains 16 inches in diameter and larger, automatic air release valves will be placed at all high points and at the down-slope side of all valve locations. Air/vacuum and vacuum release valves shall be approved on a case-by-case basis. *All reclaimed mains twenty-four (24) inches and larger will include an 18" outlet with blind flange installation at high points where the installation of an ARV would be necessary. In the absence of an ARV requirement, an 18" outlet with blind flange shall be placed every 2500 feet.*

9. Dead-end mains shall terminate with a flushing device and flushing devices shall be installed as necessary to facilitate flushing of the system.

10. Mains shall have an approved flushing device located at the high point between main intersections.

11. Joint restraint for pipes larger than 16 inch diameter shall be by use of integral, factory joint restraint systems, or by restraint gaskets.

12. Joint restraint shall be provided for all pipe bends and where necessary when joint deflection is utilized. When joint restraints are required in intersections, the joint restraints shall extend, at a minimum, to the point of curvature (PC) of the curb line. Notes shall be placed in both plan and profile views and shall include at a minimum the type of restraint to be utilized and the beginning and ending stations of the restraint.

13. The proximity of other utilities and structures must be taken into account when specifying the use of thrust blocking. The use of thrust blocks will be prohibited in the downtown area (Loop 1 to I35 and Lady Bird Lake to 30th Street) due to the congestion of utilities, structures and excavations in the right of way. Concrete thrust blocking may be approved on a case by case basis.

14. Connections of new reclaimed mains to existing reclaimed mains shall be made by cutting in a tee. Tapping sleeves may be allowed in lieu of cutting in a tee on a case-by-case basis. Full-body tapping sleeves shall be used. A tapping sleeve will not be allowed if the materials and conditions of the existing main preclude tapping. "Size on size" taps will not be permitted, unless made by use of an approved full bodied mechanical joint tapping sleeve .

C. Valves

1. All valves twenty-four (24) inches and smaller, shall be resilient seated gate valves.
2. Valves shall be located at the intersection of two or more mains. For lines smaller than twenty-four (24) inches, typical spacing should be 500 feet in high-density areas and 1,200 feet in residential area. Mains twenty-four (24) inches and larger shall be valved at intervals not to exceed 2,000 ft.
3. At dead ends, gate valves shall be located one (1) pipe length ten (10-ft. minimum) from the end points of the main. The Engineer shall provide - and show drawings - complete restraint for all such valves, pipe extensions and end caps.
4. Branch piping (both new and future branches) shall be separated from the main with gate valves.
5. For all reclaimed mains ~~mains twelve (12) and smaller~~, valves at intersections shall be placed at point of curvature (p.c.) of the curb line.
6. Valves shall be located so that isolating any main intersection requires closing of no more than three (3) valves.
- ~~7. Double disc gate valves may be used at other locations where, in the judgment of the Design Engineer, complete shut out is critical.~~
- ~~8.~~ 7. The operating nut or extension of any valve shall be between eighteen (18) inches and twenty-four (24) inches below finished grade.
- ~~9.~~ 8. Valves with valve extensions and those at pressure zone boundaries shall be equipped with a locking type debris cap.
- ~~10.~~ 9. All horizontal gate valves larger than sixteen (16) inches shall have the ~~operating bonnet~~ valve actuator (gearing) located in a vault or manhole.
- ~~11.~~ 10. Butterfly valves shall not be allowed.
- ~~12.~~ 11. Valve boxes and lids shall be square, with "Reclaimed Water" indicated on the lid.

12. Reclaimed water mains shall be designed so that valves can be installed vertically unless conditions dictate otherwise.

D. Services

1. Reclaimed water services shall be in accordance with City of Austin Standard Details.
2. The plans shall show the locations of backflow prevention assemblies.
3. The plans shall show irrigation lines, sizes, and specify pipe color (purple). All sprinkler heads and sprinkler control box covers shall be purple.
4. The plans shall show reclaimed meter locations and specify a color (purple).
5. Services for cooling towers or interior building use shall have a separate meter.
6. Meter boxes and vaults shall be square or rectangular with “Reclaimed Water” cast into the lid.
7. **Reclaimed water meters shall be placed within the public ROW or in an easement.** Reclaimed water meter boxes are not allowed in sidewalks or driveways.

8. Service taps to reclaimed mains shall be separated from other taps and pipe joints by a minimum distance of 3 feet.

9. Service taps, regardless of type, shall not be made in vaults.

E. Easements

1. Easements for reclaimed water mains shall be a minimum of 15 feet wide, or twice the depth of the main, measured from finished grade to pipe flowline, whichever is greater. Mains shall be centered on the easement. Narrower easements will be considered where the Engineer provides evidence, to the satisfaction of AWU, that maintenance activities will not be hindered by the reduced width.

2. Easement documents and the metes and bounds shall be reviewed and approved by AWU Pipeline Engineering prior to recordation with the County. Easement recordation at the County is required prior to AWU approval of construction plans.

F. Requirements for Existing and Proposed Reclaimed Water Infrastructure beneath Circular Intersections or Other Geometric Street Features

1. Installation of Circular Intersections or Other Geometric Street Features over existing reclaimed water infrastructure.

a. Existing reclaimed water infrastructure may be allowed to exist beneath circular intersections or other geometric street features such as, but not limited to, modern roundabouts, medians, bulb-outs, splitter islands, channelization islands, and other types of physical roadway features. These features may contain hardscaping, landscaping, water quality features, public art, permanent structures, street furniture, or other similar amenities.

b. The planning and design of these features and their amenities shall include consideration for access, maintenance, protection, testing, cleaning, and operations of the reclaimed water infrastructure. Where existing reclaimed water facilities are to remain, trees with root zones of 18 inches in depth or greater at maturity may be considered for inclusion provided the drip lines at maturity of the proposed trees are not located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure. Public art, permanent structures, and other similar amenities may be considered for inclusion provided they are not located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure. The drip lines at maturity of ornamental trees with root zones at maturity of less than 18 inches in depth, grasses, woody or herbaceous shrubs, and street furniture may be located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure.

c. The need for relocating, replacing or protecting in place reclaimed existing water infrastructure beneath these features and their amenities shall be determined on a case-by-case basis by AWU.

2. Installation of Circular Intersections or Other Geometric Street Features in new areas of development with no existing reclaimed water infrastructure.

a. Proposed reclaimed water infrastructure may be placed beneath proposed circular intersections or other geometric street features such as, but not limited to, modern roundabouts, medians, bulb-outs, splitter islands, channelization islands, and other types of physical roadway features. These features may contain hardscaping, landscaping, water quality features, public art, permanent structures, street furniture, or other similar amenities.

b. The planning and design of these features and their amenities shall include consideration for access, maintenance, protection, testing, cleaning, and operations of utility infrastructures. Trees with root zones of 18 inches in depth or greater at maturity may be considered for inclusion provided the drip lines at maturity of the proposed trees are not located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure. Public art, permanent structures, and other similar amenities may be considered for inclusion provided they are not located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure. The drip lines at maturity of ornamental trees with root zones at maturity of less than 18 inches in depth, grasses, woody or herbaceous shrubs, and street furniture may be located within a minimum horizontal separation of 7.5 feet from any reclaimed water infrastructure.

c. The need for alternative alignments or the inclusion of protective systems for the proposed reclaimed water infrastructure beneath these features and their amenities shall be determined on a case-by-case basis by AWU.